

# Nasoalveolar molding in a case of incomplete cleft lip: Is it worth doing?

Access this article online

Website:  
www.amsjournal.com

DOI:  
10.4103/2231-0746.161112

Quick Response Code:



Elçin Esenlik, Mustafa Asim Aydın<sup>1</sup>

Department of Orthodontics, Faculty of Dentistry, Süleyman Demirel University,  
<sup>1</sup>Department of Aesthetic Plastic and Reconstructive Surgery, Faculty of Medicine,  
Süleyman Demirel University, Isparta, Turkey

Address for correspondence:

Dr. Elçin Esenlik, Department of Orthodontics, Faculty of Dentistry,  
Süleyman Demirel University, Cunur 32260, Isparta, Turkey.  
E-mail: elcinesenlik@gmail.com

## ABSTRACT

The purpose of this study was to evaluate the effects of presurgical nasoalveolar molding in an infant with incomplete cleft lip and alveolar notch. The patient was a 15-day-old female infant with a two-thirds vertical separation of the left side of the upper lip, with an intact nasal sill. A modified molding appliance was made to improve nasal esthetics and correct the alveolar notch. Although the nasal and alveolar region abnormalities were not serious, the molding appliance improved the nasal and lip esthetics and was stable during the 4-year follow-up.

**Keywords:** Alveolar notch, cleft lip, presurgical orthopedics

## INTRODUCTION

A unilateral cleft defect is characterized by a wide nostril base and separated lip segments on the cleft side. The affected lower lateral nasal cartilage is displaced laterally and inferiorly, resulting in a depressed dome, increased alar rim, oblique columella, and overhanging nostril apex.<sup>[1]</sup> When associated with a cleft palate, the nasal septum deviates to the noncleft side and the nasal base shifts. The maxillary structure of the cleft lip and palate is divided into two or three segments by the cleft of the palate and alveolus. Wider extensive clefts are associated with severe nasolabial deformities, presenting a significant surgical challenge to achieve a functional and aesthetic outcome. However, cleft lip without cleft palate is less frequent than cleft lip with palate deformities. The incidence of isolated cleft palate has also been reported to be less than cleft lip and palate.<sup>[2]</sup>

Cleft lip and/or palate patients have numerous problems including functional eating ability, esthetics, and speech and psychological issues. These cases are best managed by a team of experts. Management of the cleft lip and/or cleft palate is a process that begins in infancy and continues into adulthood. These patients undergo many surgical procedures throughout life. Numerous methods and treatment strategies have been developed over the

years to reduce the number of surgeries. For instance, presurgical nasal alveolar molding in children with cleft lip and palate are preferred by certain orthodontists because improved results allow repositioning of the maxillary alveolus and surrounding soft tissues. Recently, Grayson and Cutting described the “presurgical nasoalveolar molding (PNAM)” concept for molding not only cleft segments but also nasal appearance and reported numerous PNAM treatment outcomes. They suggested this appliance would improve nasal appearance, result in fewer secondary nasal surgeries, allow gingivoperiosteoplasty (minimizing the need for alveolar bone grafting later), and have limited maxillary growth disturbance.<sup>[3]</sup> This procedure has become very popular because of its nasal molding effect.

Although the interest has been largely on complete skeletal clefts, only a few studies have been reported regarding treatment modalities in incomplete cleft patients.<sup>[4]</sup> This study reports a case of incomplete cleft lip, and alveolar notch treated with a nasal molding appliance and resulting in acceptable nasal aesthetics.

## CASE REPORT

The patient was a 15-day-old female infant with an upper lip cleft on the left side. Her parent’s chief complaints were cleft lip

and nose aesthetics. The infant was the second child and there was no family history of congenital birth defects. Her delivery had been normal and her medical history showed no systemic disorders. Clinical examination revealed a vertical separation of two-thirds of the left side of the upper lip with an intact nasal sill. The left naris was somewhat depressed, and the nasal tip deviated to the cleft side. The cleft lip was associated with an alveolar notch [Figure 1a and b]. The objective was to close the lip parts toward each other, improve the symmetry of the nose, and correct the notching of the alveolar region. For this purpose, a modified molding appliance was made to improve nasal esthetics and to stimulate vertical growth at the alveolar notch. The appliance was designed with two nasal parts for both right and left sides. The left part was made as usual, but the right part as only a ball [Figure 1c and d]. This modification was thought to be useful to better control the nasal septum. The left side was raised weekly, using acrylic, while the other side was activated mesially to support the nasal tip and septum. In addition, an alveolar correction was made by removal of a portion of the acrylic from the intraoral area weekly. Strip bands were also used to facilitate closing the lip.

After establishing a more vertical left naris, the cleft lip was reconstructed at 5.5 months using the Millard technique with

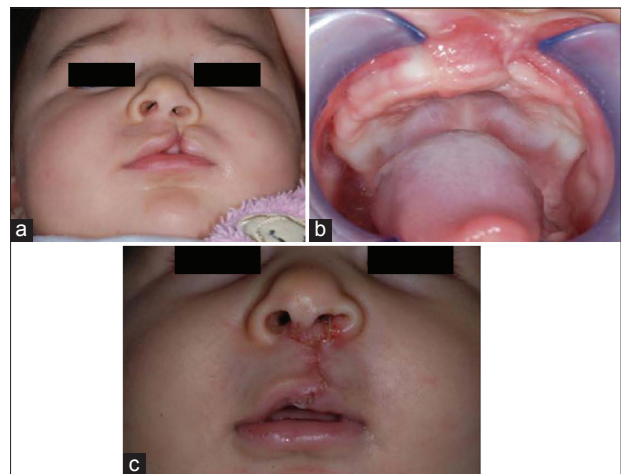
Mohler's modification [Figure 2]. A nasal stent was applied for retention, and she was checked monthly for 6 months [Figure 3]. The nasal stent was custom-made with acrylic (because of its rigidity) and it was more vertical on the cleft side. After removal of the nasal stent, the patient was checked annually. At the ages of 2 and 4 years, she showed no asymmetry in the frontal view and had acceptable nose and lip appearances [Figures 4 and 5]. The notch appearance at the cleft site was improved. Clinical examination of the left central and lateral deciduous teeth showed a cross-bite at 4-year of age. She has not received any other surgical interventions. Follow-up is continuing annually.

## DISCUSSION

Prevalence studies on oral clefts have shown that clefts that simultaneously involve the primary and secondary palate are more frequent, and the prevalence of incomplete cleft lips are lesser.<sup>[5]</sup> Alveolar notch is characterized with reduced alveolar vertical bone.<sup>[6]</sup> Although the presence of alveolar notch has usually been disregarded, adequacy of alveolar cleft at the cleft site is actually very important for proper incisor teeth eruption.<sup>[6,7]</sup> Although patients with incomplete cleft lip exhibit more acceptable nose and lip esthetics with a good facial pattern compared to the



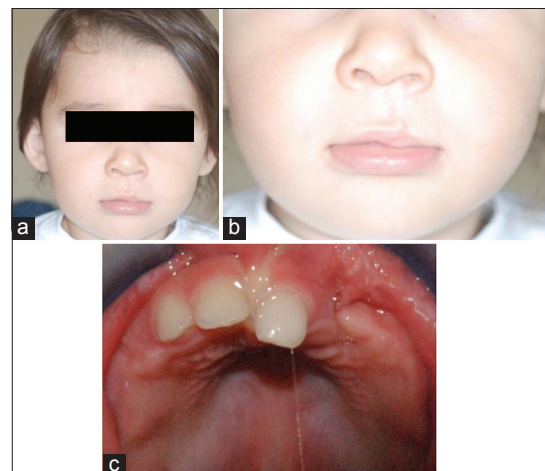
**Figure 1:** (a-d) Pretreatment facial and intraoral photographs and nasoalveolar molding appliance



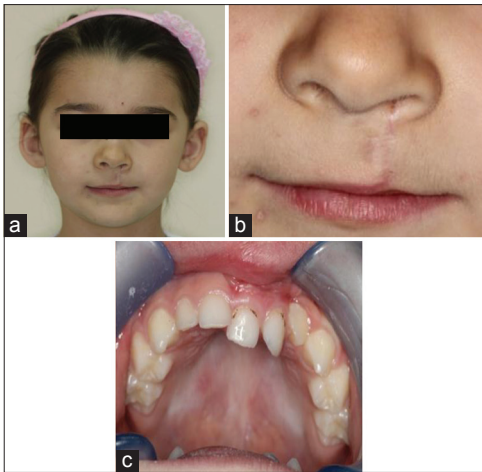
**Figure 2:** (a-c) Postorthopedic photographs at postsurgery 1<sup>st</sup> month



**Figure 3:** (a-d) Acrylic nasal stent at postsurgery 3<sup>rd</sup> month



**Figure 4:** (a-c) Facial and intraoral photographs at 2 year follow-up



**Figure 5:** (a-c) Facial and intraoral photographs at 4-year follow-up

complete cleft lip/palate cases, they may also require secondary surgeries of the nose and lip.

An interdisciplinary treatment was thought to be necessary for the present case to achieve better aesthetics. A presurgical nasal alveolar molding procedure can create alveolar alignment and can also improve nasal symmetry in unilateral cases. Punga and Sharma investigated the effects of a nasal stent and found significant improvement in nasal morphology and better nasal aesthetics presurgically compared to patients that did not undergo nasal molding.<sup>[6]</sup> Some regression in improvement is often seen in the following years due to differential growth patterns within the nasal subunits. The nasal septal and columellar deviation seen in unilateral cleft lip and palate can also be improved with a molding device. Although in the present case the cleft lip and alveolus were not complete, the nose tip, left naris, and nasal septum were affected as well as the lip and alveolus. Cartilage molding is suggested to be performed at the early months since the nasal cartilages are most able to mold easily in the postnatal 2 months due to the influence of maternal estrogen.<sup>[9]</sup>

A nasoalveolar molding appliance was used in the present case to correct the nasal region as well as the alveolar notching. The nasal molding part of the appliance was modified to include two parts for both the cleft and noncleft sides to better control the nasal septal deviation. In spite of the fact that the nasal region was not seriously affected, it was thought that the nasal symmetry could be improved, and additional nasal surgery could be prevented by early molding of the cartilages. Besides nostril retainers can be preferred for preoperative nasal molding in incomplete clefts with intact nostril bases.<sup>[6]</sup> In this case, PNAM appliance simultaneously corrected alveolar and nasal deformities.

Whether the improvement in nasal symmetry and appearance using PNAM is permanent, remains controversial. Relapse that take place in the 1<sup>st</sup> years postoperatively but stabilize after that has been noted.<sup>[10]</sup> It has been reported that 10% and 20% relapses in nostril width and height, respectively, in the 1<sup>st</sup> year should be expected.<sup>[10]</sup> Therefore, using the nasal stent is of great importance

after the primary operation for maintaining the nasal correction. A custom-made acrylic nasal stent was used for 6 months after the primary surgery in the present case. Acrylic was used because it provided more rigidity than the commercial elastic ones.

The treatment of this patient was unconventional but successful in significantly improving nasal aesthetics and alveolar crest deficiency, and results were stable 4-year after the removal of the appliance. In cases where the nasal discrepancy and alveolar deficiency are mild and esthetic concerns are moderate, nasal molding by orthodontic appliance could be recommended. However, one should be cautious in a growing patient, and the appliance should be renewed to avoid impeding the maxillary growth.

## CONCLUSION

An incomplete cleft lip case exhibiting alveolar notch and mild alar flaring with depressed dome causing nasal asymmetry were satisfactorily treated with nasoalveolar molding plate and the procedure contributed positively to her nasal aesthetics over the long term. Besides, alveolar notch and deficiency was improved by molding the alveolus.

## REFERENCES

1. Bardach J, Cutting CB. Anatomy of the unilateral and bilateral cleft lip and nose. In: Bardach J, Morris HL, editors. *Multidisciplinary Management of Cleft Lip and Palate*. Philadelphia: WB Saunders; 1990. p. 150-9.
2. Yenidünya MO, Gürel M, Liman S, Uçak M, Karakaş AÖ. Quadrangular flap technique in cleft lip repair. *Yeni Med J* 2009;26:230-5.
3. Grayson BH, Cutting CB. Presurgical nasoalveolar orthopedic molding in primary correction of the nose, lip, and alveolus of infants born with unilateral and bilateral clefts. *Cleft Palate Craniofac J* 2001;38:193-8.
4. Mishima K, Mori Y, Sugahara T, Sakuda M. Comparison between the palatal configurations in complete and incomplete unilateral cleft lip and palate infants under 18 months of age. *Cleft Palate Craniofac J* 2001;38:49-54.
5. Lin AE, Yuzuriha S, McLean S, Mulliken JB. Lesser forms of cleft lip associated with the branchio-oculo-facial syndrome. *J Craniofac Surg* 2009;20 Suppl 1:608-11.
6. Matsuo K, Hirose T. Preoperative non-surgical over-correction of cleft lip nasal deformity. *Br J Plast Surg* 1991;44:5-11.
7. Yılmaz S, Kiliç AR, Keles A, Efeoglu E. Reconstruction of an alveolar cleft for orthodontic tooth movement. *Am J Orthod Dentofacial Orthop* 2000;117:156-63.
8. Punga R, Sharma SM. Presurgical orthopaedic nasoalveolar molding in cleft lip and palate infants: A comparative evaluation of cases done with and without nasal stents. *J Maxillofac Oral Surg* 2013;12:273-88.
9. Singh GD, Moxham BJ, Langley MS, Waddington RJ, Embury G. Changes in the composition of glycosaminoglycans during normal palatogenesis in the rat. *Arch Oral Biol* 1994;39:401-7.
10. Maull DJ, Grayson BH, Cutting CB, Brecht LL, Bookstein FL, Khorrambadi D, *et al*. Long-term effects of nasoalveolar molding on three-dimensional nasal shape in unilateral clefts. *Cleft Palate Craniofac J* 1999;36:391-7.

**Cite this article as:** Esenlik E, Aydin MA. Nasoalveolar molding in a case of incomplete cleft lip: Is it worth doing? *Ann Maxillofac Surg* 2015;5:112-4.

**Source of Support:** Nil, **Conflict of Interest:** None declared.